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UNITED STATES PATENT APPLICATION

FOR

AUTOMATED TELEPHONE CONFERENCING METHOD AND SYSTEM

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AUTOMATED TELEPHONE CONFERENCING METHOD AND SYSTEM

RELATED U.S. APPLICATIONS

This application incorporates herein by reference, and claims priority to,
5 the commonly-owned co-pending provisional patent application U.S. serial
number 60/467,794, entitled "MULTI-MODE CONFERENCE CALL SETUP
AND MANAGEMENT AND DATA BROWSING USER INTERFACE
TECHNIQUE ('MULLET DATEBOOK') AND DYNAMIC SIZING USER
INTERFACE TECHNIQUE FOR DATA DISPLAY AND TEXT-KEY
10 CUSTOMIZATION FOR AUDIO MENU SELECTION," filed May 1, 2003, and
assigned to the assignee of the present invention.

FIELD OF THE INVENTION

Embodiments of the present disclosure relate generally to computing
15 systems. In particular, embodiments of the present disclosure relate to a method
and system for automated telephone conferencing using a portable computing
system.

BACKGROUND OF THE INVENTION

20 The miniaturization of components used in the construction of computer
systems has resulted in the emergence of new categories of computing devices.
One such new category of computing device includes the so called hand held
computing systems. A handheld computer system is small enough to be held in
the hand of a user. Handheld computing systems have traditionally been used
25 in the performance of various functions that require computing including

personal organization tasks, wireless e-mail receipt and transmission, note-taking, and electronic games.

An area that has not heretofore been affected by handheld computing is telephonic conferencing applications. Conferencing is an important tool in today's corporate environment. Individuals need to be brought together in an effort to achieve important corporate goals. However, as a result of the severe time demands that many corporate professionals and executives are confronted with, it is often literally impossible to bring the important players together physically for each meeting. Consequently, telephonic conferencing schemes have begun to emerge.

Conventional telephonic conferencing schemes typically involve the manual ascertainment and dialing of each of the prospective conference participants telephone numbers. It should be appreciated that all of the tasks involved in telephonically convening the prospective conference participants such as redialing prospective participants when a line is busy, or where no connection is achieved must be performed manually. The tedious task involved in operating such systems render such systems inefficient and undesirable.

SUMMARY OF THE INVENTION

Accordingly, a need exists for a method and system for automated telephone conferencing. The present invention provides a method and system that accomplishes this need.

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A computer implemented method of conducting a teleconference is disclosed. The method includes selecting a group of potential conferees using a graphical user interface tool displayed on a display screen, automatically setting up the teleconference by accessing telephone numbers for each conferee of the group of potential conferees and individually attempting to make contact with the group of potential conferees over a telephone system. The method further includes updating contact status information for the group of potential conferees during the automatic set up of the teleconference. A teleconference is established between the available conferees of the group of potential conferees.

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A computer implemented method of electronically convening conferees is disclosed. The method includes selecting one or more prospective electronic conferees and presenting information corresponding to the one or more prospective conferees on a computer display. The method further includes employing conferencing control resources associated with the display to electronically and automatically convene the one or more prospective electronic conferees based on the information such that communication among the one or more prospective electronic conferees is facilitated. In one embodiment, the method may be implemented on a portable computer system having wireless telephone capabilities.

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A conferencing system is also disclosed. The system includes a processor, a memory, a display for presenting information about prospective conferees and conferencing control resources associated with said display. The conferencing control resources are employed to cause prospective conferees to be automatically convened telephonically. Information regarding the status of conferees and the telephonic conference may be mirrored to each conferee that has joined the conference.

10 A conferencing system is disclosed. The system includes a processor and a memory associated with a display. Moreover, the system includes conferencing control resources associated with said display. The conferencing control resources are employed to cause prospective conferees to be automatically convened telephonically based on information accommodated by said display. The system may utilize a portable computing device having wireless telephone capabilities.

In one embodiment, a user interface on a display screen may be used to select a group of potential conferees, e.g., from among a listing as found in an electronic address book application. Or, a group of potential conferees may be pre-established and stored under a grouping identification. Once selected, the portable computer, or other electronic device, automatically attempts to contact each potential conferee and when contacted, automatically plays a recorded message indicating that participation in the conference is requested.

25 Telephonically, contacted conferees are then allowed to join the conference.

An on-screen user interface illustrates the connection and contact status for each conferee, e.g., connected, not available, on-hold, etc. Gathering the telephone numbers for each contact, calling them, connecting them to the conference and maintaining conference status are all done automatically by the electronic computing device. Special telephone functions such as mute, hang-up, etc. can be applied to any conferee by merely selecting the on-screen conferee name and then selecting the appropriate function. Conference status information can be mirrored to each connected conferee.

These and other advantages of the present invention will no doubt become obvious to those of ordinary skill in the art after having read the following detailed description of the preferred embodiments which are illustrated in the drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and form a part of this specification, illustrate embodiments of the invention and, together with
5 the description, serve to explain the principles of the invention.

Figure 1A shows a portable computing device with wireless telephone capabilities and having a display screen according to one embodiment of the present invention.

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Figure 1B shows an on-screen menu of the automated telephone conferencing system that facilitates the launching of telephonic conferencing operations according to one embodiment of the present invention.

15 Figure 2 shows an on screen telephone conferencing systems conference call setup menu according to one embodiment of the present invention.

Figure 3 shows a phone number lookup menu of an automated
20 telephone conferencing system according to one embodiment of the present invention.

Figure 4 illustrates the use of the phone number lookup menu to facilitate a selection of a prospective conferees phone number according to one
25 embodiment of the present invention.

Figure 5 illustrates the copying of a selected number to the call setup list of conference call setup menu according to one embodiment of the present invention.

5 Figure 6 illustrates the use of the keypad hard buttons to dial numbers of prospective call conferees according to one embodiment of the present invention.

10 Figure 7 illustrates the use of the up/down button/function to control movement of the highlight bar within conference call setup menu according to one embodiment of the present invention.

15 Figure 8 illustrates the use of the lookup button/function to add a prospective call conferee to the call setup list in the conference call setup menu according to one embodiment of the present invention.

20 Figure 9 illustrates the use of the up/down button function to control movement of the highlight bar within the call setup list provided by the conference call setup menu in order to select a number for deletion according to one embodiment of the present invention.

25 Figure 10 illustrates the use of the hard button keypad to control movement of the highlight bar within the call setup list provided by the conference call setup menu in order to select a number for deletion according to one embodiment of the present invention.

Figure 11 illustrates the use of the up/down button function to control the movement of the highlight bar within the list provided by the conference call setup menu in order to select a number for deletion according to one embodiment of the present invention.

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Figure 12 illustrates the use of a provided button/function to effect the deletion of a number from the conference call setup menu call setup list according to one embodiment of the present invention.

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Figure 13 illustrates the use of the lookup button/function to effect the addition of a number to the conference call setup menu call setup list according to one embodiment of the present invention.

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Figure 14 further illustrates the use of the lookup button/function to effect the addition of a number to the conference call setup menu call setup list according to one embodiment of the present invention.

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Figure 15 shows a help menu according to one embodiment of the present invention.

Figure 16A shows a conference call dialing setup menu according to one embodiment of the present invention.

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Figure 16B illustrates a conference call setup menu after the call cancel button/function has been selected according to one embodiment of the present invention.

Figure 17 illustrates a call setup menu after an attempted connection has failed according to one embodiment of the present invention.

5 Figure 18 illustrates a call setup menu when a line is busy according to one embodiment of the present invention.

Figure 19 illustrates the appearance of a call setup menu when connection is achieved according to one embodiment of the present invention.

10 Figure 20 illustrates the appearance of a call setup menu when an attempted connection is made while a call conferee is on hold according to one embodiment of the present invention.

15 Figure 21 illustrates the appearance of a call setup menu when an attempted connection fails while a call conferee is on hold according to one embodiment of the present invention.

20 Figure 22 illustrates the appearance of a call setup menu when an attempted connection to an additional call conferee results in a busy signal while there is a call conferee on hold according to one embodiment of the present invention.

25 Figure 23 illustrates the appearance of a call setup menu when a subsequent attempted connection is made while a call conferee is on hold according to one embodiment of the present invention.

Figure 24 illustrates the appearance of a call setup menu when an attempted connection made while a call conferee is on hold is successful according to one embodiment of the present invention.

5 Figure 25A illustrates the appearance of a call setup menu after the add to button/function has been selected according to one embodiment of the present invention.

10 Figure 25B shows the appearance of a menu after an additional conference call conferee has been selected for conferencing according to one embodiment of the present invention.

15 Figure 25C shows the appearance of a menu after the "remove from conference" text-key button/function has been selected according to one embodiment of the present invention.

20 Figure 25D shows the appearance of a menu after the selection of the "remove from conference" text-key button/function removes a prospective call conferees name from the list of conferees to be connected according to one embodiment of the present invention.

25 Figure 26 shows the appearance of a menu 560 after all prospective conferees have been connected according to one embodiment of the present invention.

Figure 27A, Figure 27B, Figure 27C, Figure 27D, and Figure 27E illustrate a closed viewer screen application of conference call dialing according to one embodiment of the present invention.

5 Figure 28A shows the appearance of a menu after all prospective call conferees have been connected according to one embodiment of the present invention.

10 Figure 28B shows an implementation of a conferee selection interface according to one embodiment of the present invention.

15 Figure 29 shows the appearance of a menu after a connected conferees name shown in the menu of Figure 28 is selected from among other connected call conferees according to one embodiment of the present invention.

20 Figure 30 shows the appearance of menu when the "disconnect from conference" button/function shown in Figure 29 is selected according to one embodiment of the present invention.

25 Figure 31 shows the appearance of a menu when the "private conversation" button/function shown in Figure 29 is selected according to one embodiment of the present invention.

30 Figure 32 shows the appearance of a menu when "on hold" call conferees and a call conferee in a private conversation have their call conferencing statuses reversed according to one embodiment of the present invention.

Figure 33 shows the appearance of a menu when connected call conferees are placed "on hold" where there is a line available for adding an additional call conferee according to one embodiment of the present invention.

5 Figure 34 shows the appearance of a menu after a new caller has been successfully connected and there is a line available for adding an additional call conferee according to one embodiment of the present invention.

10 Figure 35 shows the appearance of a menu when connected call conferees are placed "on hold" where a line is not available for adding an additional call conferee according to one embodiment of the present invention.

15 Figure 36 shows the appearance of a menu after an additional call conferee is successfully connected where a line is not available for adding an additional call conferee according to one embodiment of the present invention.

20 Figure 37 shows the appearance of a menu when a new incoming call is received during an active conference call according to one embodiment of the present invention.

Figure 38 shows the appearance of a menu when a new incoming call is received during an active conference call but cannot be conferenced according to one embodiment of the present invention.

25 Figure 39 is a flowchart of the steps performed in a method of telephonically convening conferees according to one embodiment of the present invention.

Figure 40 is a block diagram of an exemplary computer system in accordance with embodiments of the present invention.

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DETAILED DESCRIPTION OF THE INVENTION

In the following detailed description of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be obvious to one skilled in the art that the present invention may be practiced without these specific details. In other instances well known methods, procedures, components, and circuits have not been described in detail as not to unnecessarily obscure aspects of the present invention.

Some portions of the detailed descriptions which follow are presented in terms of procedures, logic blocks, processing, and other symbolic representations of operations on data bits within a computer memory. These descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. An procedure, logic block, process, etc., is here, and generally, conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a computer system. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise

as apparent from the following discussions, it is appreciated that throughout the present invention, discussions utilizing terms such as "selecting" or "employing" or the like, refer to the action and processes of a computer system, or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

AUTOMATED TELEPHONE CONFERENCING SYSTEM ACCORDING TO EMBODIMENTS OF THE PRESENT INVENTION

Figure 1A shows a portable computing device 10 having a display screen 11 and wireless telephone capabilities that may be employed in the presentation of the automated telephone conference call setup and control menus that are described herein. Computing device 10 may also include computing device keypad hard buttons 13 that may be employed as a means of inputting data. It should be appreciated that according to one embodiment, the portable computing device 10 may be hand held and may also accommodate the utilization of handwriting recognition (made such as through the use of a stylus and digitizer) as a means of inputting information for the purpose of controlling processes and functionality of the automated telephone call conferencing system described herein.

Conference Call Setup Operations

Figures 1B-16 show conference call setup menus of an automated telephone conferencing system that may be presented to the automated conferencing systems users during initial conference call setup operations according to one embodiment of the present invention. The conference call

setup menus that are shown in Figures 1B-16 guide a user through a process of building a list of prospective conference call conferees to be convened for a prospective conference call. According to one embodiment, the telephonic convening of the listed prospective conference call conferees may be
5 automatically executed through the herein described automated processes of the automated telephone conferencing system of the present invention.

Figure 1B shows a menu 100 of the automated telephone conferencing system that facilitates the launching of telephonic conferencing operations
10 according to one embodiment of the present invention. Menu 100 displays text-key button/functions that may be employed to initiate or access functionalities and features provided by the automated telephone conferencing system. The button/functions that are displayed in menu 100 may include but are not limited to "speed dial", "SMS msgs", "camera", "call logs", "address", "data book",
15 "calculator", "expense", and "conference phone" (e.g., 115).

According to one embodiment, the selection of the "conference phone" text-key button/function 115 displayed in menu 100 triggers the launching of the systems automated telephone conferencing operations according to one
20 embodiment of the present invention. It should be appreciated that the selection of the conference phone text-key button/function 115 prompts a conference call set up menu 200 to be presented for display to a system user.

Figure 2 shows a telephone conferencing systems conference call setup
25 menu 200 according to one embodiment of the present invention. Conference call setup menu 200 includes a call setup list 201, a lookup button function 203, cursor 207 and a dial button function 205. According to one embodiment, the

telephone numbers of prospective call conferees may be entered onto the "caller lines" (see Figure 2) of the call setup list 201. It should be appreciated that several prospective call conferees may be added to the call setup list so that they may be convened for telephonic conferencing purposes. The entry of a prospective conferees number onto a caller line may be effected by highlighting a caller line with a blinking cursor (e.g., 207). After the caller line is highlighted, a blinking lookup text-key button/function 203 may appear next to that caller line in the call setup list 201 to facilitate a lookup of a prospective conferees phone number (see Figure 3) for listing on that line.

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Figure 3 shows a telephone number lookup menu 300 of an automated telephone conferencing system according to one embodiment of the present invention. According to one embodiment, telephone number lookup menu 300 is presented upon the selection of the lookup text-key button function 203 discussed with reference to Figure 2. Telephone number lookup menu 300 includes names of prospective conferees 301, telephone numbers of prospective conferees 303, scroller button/function 305, and cancel button/function 307.

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Figure 4 illustrates the use of the telephone number lookup menu 300 to facilitate a selection of a prospective call conferees name and telephone number according to one embodiment of the present invention. Figure 4 shows in addition to the items enumerated above with reference to Figure 3, prospective conferee name/number highlight bar 309. According to one embodiment, a user may select a prospective call conferee 303 to be added to the call setup list (e.g., 201) by using the scroller button/function 305 (or using a stylus such as by "tapping") to move the name/number highlight bar 309 to

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highlight a telephone name and number of a prospective conferee 303 that is desired to be added to the call setup list (e.g., 201).

Figure 5 illustrates the copying of a selected number to the call setup list of conference call setup menu 200 according to one embodiment of the present invention. According to one embodiment, once the user selection of a prospective conferee is completed (as discussed with reference to Figure 3 and Figure 4) the selected number is copied onto the highlighted line of call setup menu 200 and the cursor 207 (highlight) moves down to the following line.

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Figure 6 illustrates the use of the keypad hard buttons (e.g., 13) to dial numbers of prospective call conferees according to one embodiment of the present invention. Referring to Figure 6, a number entered directly using the hard button keypad is copied onto a highlighted line of conference call setup menu 200. It should be appreciated that a movement of the cursor to the following line after the entry of the number may be controlled through the use of up/down button/function (e.g. 305).

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Figure 7 illustrates the use of the up/down button/function to control movement of the highlight bar within conference call setup menu 200 according to one embodiment of the present invention. As is illustrated in Figure 7, the highlight bar may be moved downward within the conference call setup menu 200 through the use of the up/down button function after a number is entered using the hard button keypad.

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Figure 8 illustrates the use of the lookup button function (e.g., 203) to add a prospective call conferee to the call setup list in the conference call setup

menu 200 according to one embodiment of the present invention. As is illustrated in Figure 8, the highlight bar (e.g., cursor 207) may be moved downward automatically after the call conferee is added using the lookup button function as described above.

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Figure 9 illustrates the use of the up/down button function to control the movement of a cursor within the call setup list provided by the conference call setup menu 200 in order to select a call conferees number for deletion according to one embodiment of the present invention. It should be appreciated that a call conferees number may be selected for deletion either by using the up/down button function to control the movement of a cursor within the call setup list to reach the "caller line" containing the number, or by "tapping" (such as with a stylus) on the "caller line" that contains the number that is desired deleted. For example, as is illustrated in Figure 9, by pressing the up/down button/function (e.g., 305) twice, the cursor may be moved from line 4 to line 2. In this manner the number of the call conferee contained on line 2 of the conference call setup menu (e.g., 201) may be selected for deletion. It is important to note that users may delete single characters present on a "caller line" by using a special purpose button/function (not shown) specifically provided for character deletion or by using automatic handwriting recognition.

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Figure 10 illustrates the use of the hard button keypad to control movement of the cursor within the call setup list provided by the conference call setup menu 200 in order to select a number for deletion according to one embodiment of the present invention. Figure 10 illustrates the case where line number "2" is entered with a hard button keypad so that the number contained

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thereon may be deleted. It should be appreciated that this operation may also be effected through the use of handwriting recognition.

Figure 11 illustrates the use of the up/down button function to control the movement of the cursor within the list provided by the conference call setup menu 200 in order to select a number for deletion according to one embodiment of the present invention. Figure 11 illustrates the case where a line number is selected for deletion by moving the cursor up one space (from the location shown in Figure 10) using the up/down button function. It should be appreciated that this operation may also be effected through the use of a hard button keypad and/or the use of handwriting recognition.

Figure 12 illustrates the use of a button/function provided specifically to effect the deletion of a number from the conference call setup menu 200 call setup list according to one embodiment of the present invention. As is shown in Figure 12, the name listed on line 1 of the conference call setup menu shown in Figure 11 is deleted from the conference call setup menu shown in Figure 12. It should be appreciated that the deletion of a number from the call setup list may be effected by the selection of a button/function (not shown) that is specifically provided to effect such a deletion or by the performance of a single graffiti delete movement on the digitizer.

Figure 13 illustrates the use of the lookup button/function to effect the addition of a number to the conference call setup menu 200 call setup list according to one embodiment of the present invention. As illustrated in Figure 13, a name is added to line 1 (shown as deleted or blank in Figure 12) using the lookup button/function (e.g., 203) whose operation was discussed with

reference to Figures 2-4. Figure 14 further illustrates the use of the lookup button/function (e.g., 203) to effect the addition of a number to the conference call setup menu 200 call setup list according to one embodiment of the present invention. As illustrated in Figure 14, a name is added onto line 4 of menu 200 (shown as blank in Figure 13) using the lookup button/function 203. It should be appreciated that the call set up menu 200 and its contents may be mirrored onto other displays according to one embodiment.

Figure 15 shows a help menu 310 according to one embodiment of the present invention. The help menu 310 may be presented after help button/function 209 is selected. According to one embodiment the help menu 310 explains the process of setting up a conference call. Figure 15 also shows done button/function 311 and up/down button function 313. It should be appreciated that the done button/function 311 may be employed to close the help menu 310 while the up/down button function may be used to scroll the contents of the help menu 310.

Conference Call Dialing from Setup Menu

Figure 16A shows a conference call dialing setup menu 400 according to one embodiment of the present invention. According to one embodiment, when the "dial" text-key button/function (e.g., 205 in Figure 14) is selected each of the listed prospective call conferees provided in the conference call setup list (e.g., 201) may be called in the listed sequence. It should be appreciated that the preset conference members may be called using a plurality of telephone numbers. The conference call dialing setup menu 400 lists the prospective call conferees that are to be dialed and presents connection status information (e.g.,

"connected", "failed", "busy" etc.) related to a call connection attempt that is being made.

Referring to Figure 16A, there is shown call connection status area 401,
5 call cancel button/function 403, conference cancel button/function 405,
conference call dialing list display area 407 and dialed conferee display area
409. As previously mentioned, according to one embodiment each number in
the conference call dialing list display area 407 may be called in sequence. The
call cancel button/function 403 may be used to terminate an individual call while
10 the conference cancel button/function 405 may be employed to terminate an
entire conference.

Figure 16B shows the appearance of a conference call setup menu 420
after the call cancel button/function has been selected according to one
15 embodiment of the present invention. According to one embodiment after the
call cancel button/function 403 has been selected an attempted call is ended
and the call status description "call canceled" is displayed in the call connection
status area 401. It should be appreciated that the Figure 16B call setup menu
420 includes all of the structures enumerated above in the discussion made
20 with reference to menu 400 of Figure 16A except that the dial next
button/function 411 replaces the call cancel button function 403 in the Figure
16B conference call setup menu 420. Selecting the dial next button/function
411 identifies the next number in the sequence of numbers that are to be dialed
and causes a connection attempt to be made to that number. It should be
25 appreciated that if the conference cancel button/function 405 is selected the
conference setup menu screen (Figure 14) is again presented with all the data
that was formerly entered therein presented intact.

Figure 17 shows the appearance of a conference call setup menu 420 after an attempted conference call connection has failed according to one embodiment of the present invention. According to one embodiment once an attempted connection has failed the call status description "connection failed" is displayed in the call status display area. Figure 17 shows dial next button/function 411 and conference cancel button/function 405. It should be appreciated that selecting the dial next button/function 411 at this point initiates a call to the next number in line in the sequence of numbers that have been selected to be called. It should be appreciated that if the conference cancel button/function 405 is selected then the conference setup menu (Figure 14) screen may again be presented.

Figure 18 shows the appearance of a conference call setup menu 420 when a line is found busy according to one embodiment of the present invention. According to one embodiment, the call status description "line busy" is displayed in the call status area 401 when a line is busy. It should be appreciated that selecting the dial next button/function 411 at this point initiates a call to the next number in line in the sequence of numbers that have been selected to be called. According to one embodiment busy lines may be automatically redialed. It should be appreciated that if the conference cancel button/function 405 is selected then the conference setup menu screen may again be presented.

Figure 19 shows the appearance of a conference call setup menu 440 when a conference call connection is achieved according to one embodiment of the present invention. According to one embodiment, when a conference call

connection is achieved the call status description "connected" is displayed in the call status display area 401. The Figure 19 menu 440 includes dial next button/function 411, mute button/function 413 and speaker button/function 415. It should be appreciated that selecting the dial next button/function 411 initiates the dialing of the next number in line in the sequence of numbers that have been selected to be dialed. According to one embodiment, once a prospective call conferee has been successfully connected the next prospective call conferee may be dialed. It should be appreciated that the mute and speaker text-key button/functions may be employed to either mute a connected caller or place the connected caller on a speaker. According to one embodiment, the call time may be shown as a line item next to an individual callers name.

Figure 20 shows the appearance of a conference call setup menu 460 when an attempted call connection is made while a call conferee is on hold according to one embodiment of the present invention. According to one embodiment, when this occurs the call status description "connecting" may be displayed in the call status display area 401 indicating that an attempted connection is being made. It should be appreciated that the number that is being called may be displayed on the viewer screen 409 as is shown in Figure 20. The call conferee(s) who are on hold are displayed in viewer display 417.

Figure 21 shows the appearance of a conference call setup menu 480 when an attempted connection fails while a call conferee is on hold according to one embodiment of the present invention. According to one embodiment, when an attempted connection fails while a call conferee is on hold the status description "no connection" may be displayed in the call status display area 401. It should be appreciated that the number that is being called may be

displayed on the viewer screen 409 as is shown in Figure 21. The call conferee(s) who are on hold are displayed in viewer display 417.

Figure 22 shows the appearance of a conference call setup menu 480 when an attempted connection to a prospective additional call conferee results in a busy signal while there is a call conferee on hold according to one embodiment of the present invention. According to one embodiment, when an attempted connection to an additional call conferee results in a busy signal while there is a call conferee on hold the status description "line busy" may be displayed in the call status display area 401. It should be appreciated that the number of the call conferee who is being called may be displayed on the viewer screen 409 of menu 480 as is shown in Figure 22. The call conferee(s) who are on hold are displayed in viewer display 417.

Figure 23 shows the appearance of a conference call setup menu 460 when a subsequent attempted connection to a prospective additional call conferee is made while a call conferee is on hold according to one embodiment of the present invention. According to one embodiment, when this occurs the status description "connecting" may be displayed in the call status display area 401 indicating that a connection attempt is in progress. It should be appreciated that the number of the call conferee who is on hold may be displayed on the viewer screen 417 of menu 460. Moreover, the number of the prospective call conferee being called may be shown in the conferee display area 409 of menu 460. According to one embodiment, if the attempted connection is achieved the user is presented with the menu shown in Figure 24. However, if the attempted connection fails the user is presented with the menu shown in either Figure 21 or Figure 22.

Figure 24 shows the appearance of a conference call setup menu 520 when an attempted connection made while a call conferee is on hold is successful according to one embodiment of the present invention. According to one embodiment, when this occurs the status description "connected" may be displayed in the call status display area 401 indicating a successful connection. It should be appreciated that the number of the call conferee that is on hold may be displayed on the viewer screen 417 of menu 520 as is shown in Figure 24. Moreover, the number of the successfully connected call conferee may be shown on the conferee display 409 of menu 520 as is shown in Figure 24.

Figure 25A shows the appearance of a conference call setup menu 540 after the add to conference button/function 541 has been selected according to one embodiment of the present invention. According to one embodiment, when this occurs the status description "connected" may be displayed in the call status display area 401 to indicate the successful connection of a newly added conferee. The numbers of the remaining prospective conferees in the calling queue are displayed on the viewer screen 407 of menu 540. In addition, the number of the successfully connected caller is added to the list of successfully connected conferees shown in conferee display 409.

The Figure 25A menu 540 includes dial next button/function 411, mute button/function 413 and speaker button/function 415 which operate as described previously. It should be appreciated that a selection of the dial next button/function 411 causes the dialing of the next number in line in the sequence of numbers that have been selected to be called. According to one embodiment, once a conferee has been successfully connected the number of

the next prospective call conferee in line may be dialed. According to one embodiment, the call time is shown as a line item next to each successfully connected call conferees name that is shown in conferee display 409.

5 Figure 25B shows the appearance of a conference setup menu 540B after a particular prospective conference call conferee has been selected from the list of prospective conferees to be called according to one embodiment of the present invention. The Figure 25B menu 540B is presented after a particular prospective call conferee (e.g., "Joe Pesce") is selected from the list of
10 prospective call conferees to be called that is displayed on the viewer screen shown in Figure 25A. Figure 25B shows "send to end of que" 541, "remove from conference" 542 and "cancel" 543 text-key button/functions.

 Figure 25C shows the appearance of a conference setup menu 540 after
15 the "send to end of queue" text-key button/function has been selected. As is shown in Figure 25C, selecting the "send to end of queue" 541 text-key button/function repositions a prospective call conferee in the calling sequence of prospective call conferees from its current position to the end of the sequence (e.g., see Figure 25C repositioning of conferee "Joe Pesce" in the calling
20 sequence from an initial position to the end of the calling sequence or queue).

 Figure 25D shows the appearance of menu 540 after the "remove from conference" 542 text-key button/function has been selected. As is shown in Figure 25D, the selection of the "remove from conference" 542 text-key
25 button/function removes a prospective call conferees name from the list of conferees to be called (e.g., see Figure 25D removal of prospective conferee "Joe Pesce" from the calling que). It should be appreciated that a selection of

the "cancel" 543 text-key button/function results in no change being made to the displayed list of prospective conferees.

Figure 26 shows the appearance of a menu 560 after all prospective call
5 conferees have been connected according to one embodiment of the present
invention. As is shown in Figure 26 the successfully connected conferees are
listed in the conferee display. If a line is available for connecting additional
conferees such may be indicated in menu 560 according to one embodiment.
Button/functions "hold" and "mute" provided in menu 560 function as previously
10 described. The "hold" button/function (used to place connected callers on
"hold") is employed in many of the conference control operations described
below.

Closed View Screen Operation

15 Figures 27A-27E illustrates a closed viewer screen application of
automated conference call dialing according to one embodiment of the present
invention. In the closed view screen mode, the viewer screen is closed and only
the information presented in the prospective conferee display 409 area is
displayed. It should be appreciated that, in other respects the options and
20 functions provided in the closed screen mode are the same as are provided in
the open viewer screen mode described above. It should be noted that Figure
27A corresponds to Figure 16, Figure 27B corresponds to Figure 19, Figure
27C corresponds to Figure 20, Figure 27D corresponds to Figure 24 and Figure
27E corresponds to Figure 25A.

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Conference Call Control Menus

Figure 28A shows the appearance of a conference call control menu 560 after all prospective call conferees have been successfully connected according to one embodiment of the present invention. It should be appreciated that once selected (such as by tapping with a stylus etc.) a successfully connected call conferees name may be shown highlighted in menu 560. According to one
5 conferees name may be shown highlighted in menu 560. According to one embodiment, any of the successfully connected conferees may be selected for application of a call control option (described below).

Figure 28B shows an implementation of a conferee selection interface
10 570 according to one embodiment of the present invention. According to one embodiment a conferee selection interface may be incorporated as a component part of an exemplary conference call control menu (e.g., 560) as is described herein. Figure 28B shows a conferee selection interface that includes teleconference control options 571, conferee selection icons 573, and conferee
15 list 575. A user desiring to apply a teleconference control option 571 (e.g., mute, hang-up, hold, private, etc.) to a particular conferee may select the conferee selection icon 573 adjacent the conferees name. Once selected the icon may graphically rotate to reveal the list of conference control options 571 that may then be selected for application to the particular conferee that is associated with
20 the icon. According to one embodiment, the conferee selection icons 573 may have a triangular geometry with a point of the triangle pointing towards the corresponding conferee associated with the conferee selection icon (when the icon is in an initial position). In the illustration shown in Figure 28B, once selected the point of the icon initially directed towards the corresponding
25 conferee is rotated downward to reveal a list of teleconferencing control options that may be selected. It should be appreciated that in other embodiments other icon geometries and graphical selection schemes may be employed.

Figure 29 shows the appearance of a conference call control menu 600 after a connected conferees name in menu 560 of Figure 28 is selected (such as by tapping with a stylus etc.) from among other connected call conferees.

- 5 After a connected conferees name in menu 560 of Figure 28 is selected, menu 600 of Figure 29 is presented displaying the "private conversation" 601, "disconnect from conference" 603, and "cancel" 605 text-key button/functions.

- Figure 30 shows the appearance of menu 560 when the "disconnect from conference" 603 button/function shown in Figure 29 is selected. As is shown in Figure 30, when the "disconnect from conference" 603 button/function shown in Figure 29 is selected, the call conferee whose name is shown in menu 600 of Figure 29 is disconnected from the call conference and their name removed from the list of connected call conferees. It should be appreciated that
- 15 each call is logged as a separate call in the systems call logs.

- Figure 31 shows the appearance of a conference call control menu 610 when the "private conversation" 601 button/function shown in Figure 29 is selected according to one embodiment of the present invention. As is shown in
- 20 Figure 31, when the "private conversation" 601 button/function shown in Figure 29 is selected, all of the connected call conferees are put on hold, except a call conferee selected for private conversation. According to one embodiment, in this mode the active call timer measures the time of the active call of the call conferee that is selected for private conversation. It should be appreciated that
- 25 "on hold" conferees (e.g., shown in display area 417) are not selectable.

Figure 32 shows the appearance of a conference call control menu 620 when "on hold" call conferees and a call conferee in a private conversation have their call conferencing statuses intentionally reversed using a specifically designated text-key button/function according to one embodiment of the present invention. According to one embodiment "on hold" call conferees and a call conferee in a private conversation may have their call conferencing statuses reversed by the selection of the "swap" (shown in Figure 32) text-key button/function 611. It should be appreciated that when "on hold" call conferees and a call conferee connected in a private conversation have their call conferencing statuses reversed, the individual call conferees that are conference connected as a consequence of the reversal may be selectable (e.g., "tapped" for disconnection or for private conversation).

Figure 33 shows the appearance of a conference call control menu 630 when connected call conferees are placed "on hold" where there is a line available for adding an additional call conferee according to one embodiment of the present invention. As is shown in Figure 33, the call conferees that have already been conferenced may be placed "on hold" until the disposition of a new call is resolved. Figure 34 shows the appearance of a menu 640 after an additional call conferee has been successfully connected and there is a line available to accommodate the successfully connected prospective call conferee according to one embodiment of the present invention. It should be appreciated that in this situation the successfully connected caller may be added to the active conference of call conferees.

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Figure 35 shows the appearance of a conference call control menu 650 when connected call conferees are placed "on hold" but a line is not available

for adding any additional call conferees according to one embodiment of the present invention. As is shown in Figure 35, the call conferees that are already conferenced may be placed "on hold" until the disposition of a new call is resolved. Figure 36 shows the appearance of a menu 660 after an additional call conferee is successfully connected but a line is not available to accommodate the successfully connected prospective call conferee according to one embodiment of the present invention. It should be appreciated that in this situation the successfully connected caller may not be added to the active conference of call conferees.

10

Figure 37 shows the appearance of a conference call control menu 670 when a new incoming call is received during an active conference call according to one embodiment of the present invention. As is shown in Figure 37, when a new incoming call is received while an active conference call is in progress the caller may be added to the active conference call in some circumstances. Referring to Figure 37, the adding of an incoming caller to the active conference call may be effected by a selection of the "hold/answer" 671 text-key button function which puts the active conference "on hold" and initiates the answering of incoming calls. Thereafter, the selection of the "conferencing" 673 text-key button/function adds the incoming caller to the active conference that is in progress. According to one embodiment, a "send to voicemail" text-key button/function (not shown) may be employed to send the incoming call to a specified voicemail system.

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Figure 38 shows the appearance of a menu 680 when a new incoming call is received during an active conference call but cannot be conferenced according to one embodiment of the present invention. Referring to Figure 38,

the receiving of the incoming call may be effected by the selection of the "hold/answer" 671 text-key button/function. Thereafter, a subsequent selection of the "hold/answer" 671 text-key button/function puts the active conference "on hold" and initiates the answering of the incoming call. However, because the incoming caller may not be added to the active conference that is already in progress, a "send to voicemail" text-key button/function (not shown) may be employed to redirect the incoming call to a voicemail system.

Figure 39A shows a flowchart 3900 of the steps performed in processes of the present invention which, in one embodiment, are carried out by processors and electrical components under the control of computer readable and computer executable instructions. The computer readable and computer executable instructions reside, for example, in data storage such as memory units 4004 and 4006 (see Figure 40). However, the computer readable and computer executable instructions may reside in other types of computer readable medium. Although specific steps are disclosed in the flowcharts, such steps are exemplary. That is, the present invention is well suited to performing various other steps or variations of the steps recited in the flowcharts. Within the present embodiment, it should be appreciated that the steps of the flowcharts may be performed by software, by hardware or by a combination of both.

Figure 39A is a flowchart 3900 of the steps performed in a method of telephonically convening conferees according to one embodiment of the present invention.

5 At step 3901, a user selects a group of conferees to be included into a telephonic conference using a graphical user interface. At step 3903, the device automatically gathers phone numbers for conferees and automatically places calls to each one. At step 3905, it is determined if a conferee has answered. If there is no answer the phone number is dialed again at a later time as
10 illustrated at step 3907. If the potential conferee answers then a recorded message is played that informs the potential conferee of the conference that is being set-up and thereafter places the conferee on hold at step 3909. At step 3911, conference status information regarding the conferees on hold and those not yet available is updated. At step 3913, steps 3901 through 3911 are
15 repeated until all conferees are connected. Once all of the conferees have been connected the setup process is ended and the teleconference is established at step 3915.

Figure 39B is a flowchart 3900 of the steps performed in a method of
20 teleconference control according to one embodiment of the present invention.

At step 3917, the status of conferees who have a status change (e.g., are dropped from conference, etc.) is updated. At step 3919, a user is allowed to use an on screen interface to select a particular conferee for the application of a
25 special teleconference control function (e.g., drop, mute, private conversation, etc.). At step 3921, the conferee status information may be mirrored to all connected conferees. And, at step 3923 it is determined if the teleconferencing

session has ended or not. If it is determined that the teleconference has not ended, steps 3917 through 3921 may be repeated.

EXEMPLARY HARDWARE IN ACCORDANCE WITH EMBODIMENTS OF THE PRESENT INVENTION

Figure 40 is a block diagram of an exemplary computer system with wireless telephone interface 4000 in accordance with embodiments of the present invention. It should be appreciated that system 4000 is not strictly limited to be a computer system. As such, system 4000 may be well suited to be any type of electronic computing device (e.g., server computer, embedded computing device, portable computing system etc.). Within the following discussions herein, certain processes and steps are discussed that are realized, in some embodiments, as a series of instructions (e.g., software program) that reside within computer readable memory units of computer system 4000 and executed by a processor(s) of system 4000. When executed, the instructions cause computer 4000 to perform specific actions and exhibit specific behavior which is described in detail below. According to one embodiment, the instructions may include code that when executed perform the automated telephone conferencing operations discussed herein with reference to Figures 39A and 39B.

Computer system 4000 of Figure 40 comprises an address/data bus 4014 for communicating information, one or more central processors 4002 coupled with bus 4014 for processing information and instructions. Central processor unit 4002 may be a microprocessor or any other type of processor. The computer 4000 also includes data storage features such as a computer

usable volatile memory unit 4004 (e.g., random access memory, static RAM, dynamic RAM, etc.) coupled with bus 4014 for storing information and instructions for central processor(s) 4002, a computer usable non-volatile memory unit 4006 (e.g., read only memory, programmable ROM, flash memory, EPROM, EEPROM, etc.) coupled with bus 4014 for storing static information and instructions for processor(s) 4002. System 4000 also includes one or more signal generating and receiving devices 4008 coupled with bus 4014 for enabling system 4000 to interface with other electronic devices. The communication interface(s) 4008 of the present embodiment may include wired and/or wireless communication technology such as a wireless telephone circuitry. For example, in some embodiments, the communication interface 4008 is a serial communication port, but could also alternatively be any of a number of well known communication standards and protocols, e.g., Universal Serial Bus (USB), Ethernet, FireWire (IEEE 1394), parallel, small computer system interface (SCSI), infrared (IR) communication, Bluetooth wireless communication, broadband, and the like.

The system 4000 may also include a computer usable mass data storage device 4012 such as a magnetic or optical disk and disk drive (e.g., hard drive or floppy diskette) coupled with bus 4014 for storing information and instructions. An optional display device 4010 may be coupled to bus 4014 of system 4000 for displaying video and/or graphics. It should be appreciated that optional display device 4010 may be a cathode ray tube (CRT), flat panel liquid crystal display (LCD), field emission display (FED), plasma display, or any other

display device suitable for displaying video and/or graphic images and alphanumeric characters recognizable to a user.

As noted above with reference to exemplary embodiments thereof, a
5 computer implemented method of conducting a teleconference is disclosed.
The method includes selecting a group of potential conferees using a graphical user interface tool displayed on a display screen, automatically setting up the teleconference by accessing telephone numbers for each conferee of the group of potential conferees and individually attempting to make contact with the
10 group of potential conferees over a telephone system. The method further includes updating contact status information for the group of potential conferees during the automatic set up of the teleconference. A teleconference is established between the available conferees of the group of potential conferees.

15 The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light
20 of the above teaching. The embodiments were chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the
25 Claims appended hereto and their equivalents.